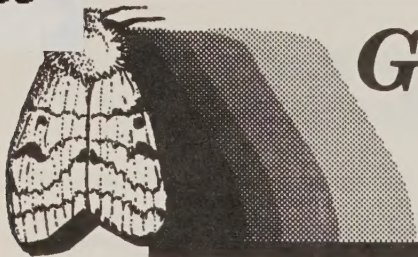


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GYPSY MOTHS NEWS



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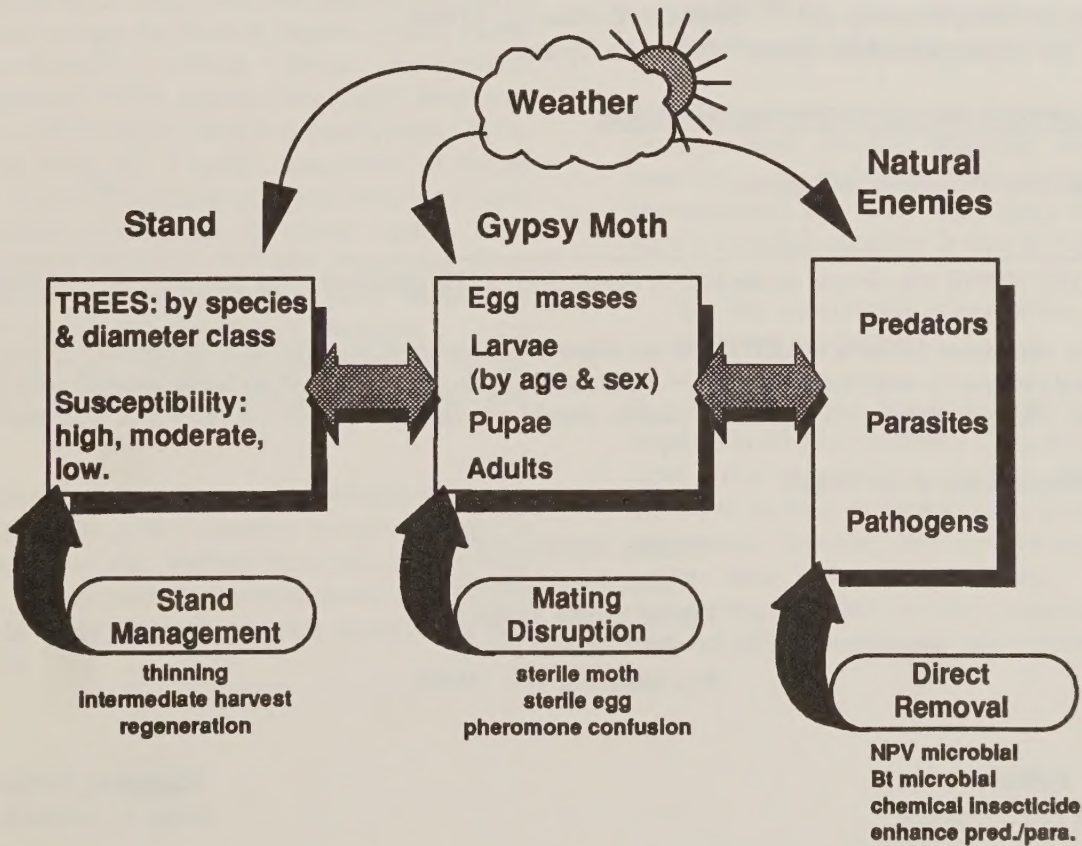
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Gypsy Moth Life System Model



(See article by J. J. Colbert on page 6.)

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EDITOR'S NOTE

"LOOK WHO'S TALKING"

"For more than half a century, the gypsy moth...has been a forest and shade tree pest of major importance in New England, and much time has been spent in the United States as well as in Europe in studying its control. Many millions of dollars have been expended in this country in fighting this insect and in endeavoring to prevent its westward spread." (R.C. Brown and R.A. Sheals, Journal of Forestry, 1944)

This issue of the NEWS features five committees whose sole purpose is to discuss gypsy moth and its management. As the preceding paragraph hints, many committees must have come and gone during the 122 years of gypsy moth presence in this country. The committees in this issue range from national perspective (The USDA Gypsy Moth Working Group) to the local level (Metropolitan Washington Gypsy Moth Coordinating Committee). What do you suppose is discussed by these committees? At the national level, certainly some coordination needs to be discussed among the Federal players--USDA Forest Service-Research, USDA Forest Service-Pest Management, USDA Animal Plant Health Inspection Service, USDA Agricultural Research Service. At the regional level, the Virginia Association of Gypsy Moth County Coordinators places emphasis upon information relevant to a county gypsy moth management program. At the community level, committees such as the Metropolitan Washington Gypsy Moth Coordinating Committee, discuss delivering a pest management program to a diverse and very complex community such as Washington, DC.

If nothing else, this layering of committees illustrates how the gypsy moth's presence occupies a place in our lives (and our wallets) from national to local levels. It also points to the sheer numbers of people involved in gypsy moth program development and delivery.

--DBT

LETTER TO THE EDITOR

Craig Kuhn, Maryland Department of Agriculture, writes:

"How will the new pesticide label for B.t. affect future suppression programs?"

Dan Twardus, Editor, responds:

"A new *B.t.* label has not been issued so there will be no change in suppression programs. However, in EPA's Registration Standard for *B.t.*, under the section for Environmental Hazards, the Agency had required the following language be placed on labels intended for forestry use:

"Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Aerial application over such sites is permissible only when they are not visible from above the tree canopy. Do not contaminate water when disposing of equipment washwaters."

The EPA determined, after much consultation, that the Environmental Hazards statement needed to be amended. As described to Novo Nordisk (a *B.t.* manufacturer) in a letter dated June 17, 1991, the EPA's amended statement is now as follows:

"Do not contaminate water when disposing of equipment washwaters."

The point being that this is the only statement now required in the Environmental Hazards Section of the label. This essentially means that since *B.t.* is not known to be toxic to aquatic life, no toxicity should be implied. You may, however, see some *B.t.* labels which have the earlier wording. Some *B.t.* manufacturers printed their new product labels only to find that EPA was changing their required language."

USDA GYPSY MOTH WORKING GROUP

**Thomas H. Hofacker
USDA Forest Service
Forest Pest Management
Washington, DC**

Faced with the question of how to coordinate the five agency gypsy moth programs into one USDA program, the Assistant Secretary of Agriculture created the USDA Gypsy Moth Working Group (GMWG) on April 11, 1983. Major impetus for formation of the GMWG came from Congress when House Report 3363 recommended the USDA establish "...a new coordinating committee..." to replace the USDA gypsy moth coordinating groups that were then in existence.

Besides serving to coordinate USDA agency gypsy moth programs, the major duties of the GMWG are to review, formulate and recommend departmental policy on gypsy moth and to review individual USDA agency roles, regulations, policies and programs on gypsy moth.

The GMWG is chartered as a Working Group under the (USDA) Secretary's Policy and Coordination Council. Al West, the Forest Service's Deputy Chief for State and Private Forestry, chairs the group.

THE USDA INTERAGENCY RESEARCH AND DEVELOPMENT COORDINATING GROUP

**Max McFadden
USDA Forest Service
Northeastern Forest Experiment Station
Radnor, PA**

Better known as the Research Coordinating Group, this body was formed in 1989 in response to a perceived need for a research management working group, one that could provide for a new level of gypsy moth coordination among the USDA agencies conducting research or methods development programs. Factors leading to the formation of the Research Coordinating Group included:

- Earlier discussions by the Gypsy Moth Working Group that more coordination was needed between the USDA agencies.
- Need by USDA agencies to recognize priority research issues and concerns and to be able to focus resources to resolve them.
- Need to provide better liaison between USDA agencies conducting research and the Gypsy Moth Working Group.

When originally constituted, the Research Coordinating Group consisted of representatives from Forest Service - Research (FS-R), the Agricultural Research Service (ARS), and the Animal and Plant Health Inspection Service (APHIS). Later, representatives from the Cooperative State Research Service (CSRS) and Forest Service - State & Private Forestry/Forest Health Protection (FS-S&PF/FHP) were added. More recently, a member of the Gypsy Moth Management Board Executive Committee has been invited to attend meetings of the group.

The Research Coordinating Group currently functions as a subgroup of the Gypsy Moth Working Group, the policy setting group for the Department of

Agriculture. Objectives of the Research Coordinating Group are to:

- monitor the progress of agency programs and any breakthroughs which may influence USDA policies.
- keep the agencies and the Gypsy Moth Working Group apprised of progress in research and methods development.
- identify research and methods development issues and concerns.
- set priorities for research and methods development.
- maximize use of current resources as well as to provide appropriate rationale to justify increased resources.

Since its inception, the Research Coordinating Group has made some notable contributions to gypsy moth research and methods development activities. Most noteworthy are:

Annual Gypsy Moth Research Review

This meeting takes place in January and brings together all scientists in all USDA agencies conducting research or methods development. The meeting has a changing format which allows for synthesis papers on specific topics, workshops where informal interaction is needed and voluntary oral reports and poster sessions. Perhaps of most importance, it provides a forum for face-to-face interactions between all scientists and users attending the session. A Proceedings is published each year.

Abnormal Performance Syndrome (APS)

APS is abnormally slow gypsy moth development observed in laboratory reared colonies. Members of the Research Coordinating Group recognized this as a serious problem early on and marshalled resources among agencies to establish a special team of scientists and technicians with appropriate resources and a three year time limit to resolve the problem. This effort will continue for one more year but no APS has been detected at the Otis Methods Development Center for over a year and the cause for

the original problem is close to being resolved.

Other examples of coordination and cooperation between the USDA agencies resulting from the Research Coordinating Group includes:

- APHIS providing a refrigerated centrifuge to the FS for increased purification of virus for Gypchek production.
- FS-R providing assistance to ARS in field evaluation of gypsy moth virus products.
- ARS providing assistance to AIPM Project in use of pheromones for mating disruption.
- FS-R and ARS sharing information on economic studies being conducted by both agencies.
- ARS providing its fat body cell line to FS-R for research purposes.

GUIDELINES FOR THE NATIONAL GYPSY MOTH MANAGEMENT BOARD

William W. Metterhouse
Director, New Jersey Department of
Agriculture and
Current Chairman, National Gypsy
Moth Management Board

Purpose

The purpose of the Board is to act as a technical advisory group to assist in coordinating gypsy moth activities in the United States; to periodically review Federal, State, and local gypsy moth programs, projects, and activities, including research; to make recommendations to the State agencies and private organizations, particularly regarding development and implementation of integrated pest management (IPM) programs for gypsy moth and the eradication of isolated spot infestations; to conduct programs to

educate the public and others about the gypsy moth (including an annual public meeting); and to act as a focal point for nationwide concerns about the gypsy moth.

Members

The Board is composed of members from State and Federal agencies, other groups and organizations, and individuals concerned with or actively involved in gypsy moth programs. Appointments to membership may also be made by the respective heads of agencies and organizations upon the invitation of the Board as confirmed by the Executive Committee, as may be needed to ensure participation from these agencies and organizations.

The Executive Committee

The officers of the Board, plus 7 elected members, constitute the Executive Committee. A majority of the membership of the Executive Committee is from State agencies concerned with gypsy moth.

The functions of the Executive Committee are to transact the official business of the National Gypsy Moth Management Board, including the general supervision of the affairs of the Board between business meetings; to fix the hour and place of meetings; to make recommendations to the Board; and to perform such other duties as are specified in the Guidelines.

ASSOCIATION OF VIRGINIA GYPSY MOTH MANAGERS: AN OVERVIEW AND SUMMARY OF ACTIVITIES

Kim Bowling-Largen
Prince-William County
and
Stephen E. Talley
Rockbridge County

There has been interest in recent years for an organized interaction among those responsible for carrying out gypsy moth programs at the local level. Presence of the recently implemented Appalachian Integrated Pest Management (AIPM) Gypsy Moth Project has provided an opportunity for careful development of this idea.

To assess interest and feasibility, a small group of AIPM county coordinators sent letters to those persons in Virginia identified as being local gypsy moth managers. Letters requesting comment and guidance were also sent to people identified as having demonstrated experience or expertise in managing gypsy moth. Significant positive comment led this group to conclude that a locally and broadly based association of gypsy moth managers could play a role in facilitating the exchange of information, expertise and ideas in a mutual effort to manage gypsy moth.

On August 10, 1989, representatives of gypsy moth programs from over 22 counties and municipalities in Virginia met in Harrisonburg to pursue this matter. Also present were members of the Virginia Gypsy Moth Advisory Council, made up of individuals from VPI faculty, the USDA Forest Service, the USDI Park Service, the Virginia Division of Game and Inland Fisheries, the Virginia Department of Forestry, the Virginia Department of Agriculture and Consumer Services, the USDA Animal and Plant Health Inspection Services, and industry, who provided guidance and technical expertise. Those locally based gypsy moth managers present made a decision to formally organize the Association of Virginia Gypsy

Moth Managers and seek broad support throughout Virginia. The session was professionally facilitated by Extension Specialists, Mike Chandler from Community Development and Jane Asche from the Center for Volunteer Development at Virginia Tech.

A committee with representatives of gypsy moth programs from seven counties was established and charged with the task of drafting preliminary documents for formalizing this association within the directions defined at the facilitated meeting. Other committees were also designated to work on specific issues including assessing professional development needs of locally based gypsy moth managers and looking at available gypsy moth information and identifying information gaps. A purpose statement and goals were mutually agreed to and are as follows:

Purpose

Recognizing the impact of gypsy moth on the people and natural resources of Virginia, we, the local government representatives of gypsy moth programs, resolve to gather and exchange information, expertise, ideas and, when appropriate, resources, in a mutual effort to manage this introduced pest.

Goals

1. To maintain an organization to deal with gypsy moth issues.
2. To gather, exchange, and disseminate timely, accurate and standardized gypsy moth information.
3. To improve public and local government awareness.
4. To improve professional skills and position of locally-based gypsy moth program representatives.
5. To achieve productive interaction between our group and local, State, and Federal government, other agencies, industry, and public interest groups.
6. To develop unified recommendations or position statements on issues of general concern.
7. To identify common concerns, problems, information gaps and needs.

METROPOLITAN WASHINGTON GYPSY MOTH COORDINATING COMMITTEE

**Noel F. Schneeberger
USDA Forest Service
Forest Health Protection
Morgantown, WV**

Mission

To enhance the efficiency and effectiveness of gypsy moth programs in the Metropolitan Washington area.

Committee Goals

1. Identify and examine issues, concerns, opportunities, and problems associated with managing gypsy moth in the metropolitan area.
2. Develop and implement solutions, procedures, or techniques for addressing common issues, concerns, opportunities or problems.
3. Encourage environmentally responsible gypsy moth management through the use of integrated pest management (IPM) techniques.
4. Coordinate gypsy moth management activities between Federal, State and local jurisdictions in the Metropolitan Washington area.
5. Provide for educational exchange between participating agencies and from outside as needed.
6. Encourage and coordinate the dissemination of timely and accurate gypsy moth information.

Background Information

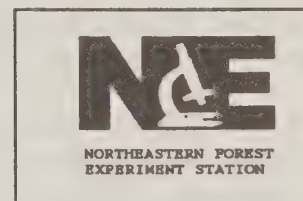
The Metropolitan Washington Gypsy Moth Coordinating Committee (MWGMCC) began in the winter of 1986-87 as an ad hoc group of Federal and local gypsy moth managers in Washington, DC. It was in the spring of 1987 that the first gypsy moth

aerial spraying projects were planned for Federal, city and private lands in the city of Washington, DC, and project managers recognized the need as well as the opportunity to coordinate activities and cooperate on projects. Soon gypsy moth coordinators from neighboring jurisdictions began attending the meetings and the Committee flourished. Members saw the need to coordinate their activities, especially the dissemination of information on a regional basis and saw in the Committee an opportunity to meet that need. The Metropolitan Washington Gypsy Moth Coordinating Committee name was subsequently adopted to reflect the expanded membership and coordination opportunities of the group.

The MWGMCC is composed of gypsy moth program managers from Federal, State, county, and city jurisdictions in the Metropolitan Washington, DC, area. The Committee meets on a quarterly basis where members present and discuss the status of gypsy moth management in their jurisdictions, with an emphasis on identifying and addressing issues, concerns, opportunities or problems common to all. This quarterly exchange of information is one of the primary goals of MWGMCC. Two subcommittees were recently authorized by the full membership. The Workshop Subcommittee is charged with the responsibility to identify informational needs of the members and to recommend workshops and seminars to address those needs. The Information Subcommittee is charged with the task of compiling examples of available gypsy moth literature and for recommending dissemination of gypsy moth information.

For more information about the Committee, contact Jamie Bartalon, Co-Chair, MWGMCC, at (703) 358-6400.

GYPSY MOTH RESEARCH AND DEVELOPMENT PROGRAM



Technology Update

THE GYPSY MOTH LIFE SYSTEM MODEL: An Update

J.J. (Jim) Colbert
USDA Forest Service
Northeastern Forest Experiment Station
Morgantown, WV

Recent developments and plans for the Gypsy Moth Life System Model (see the cover illustration) are discussed herein; recent accomplishments, what is now available, and what is coming in the near future are described. Along with this, some ideas for potential uses (the "who and the how" of it) and values that might be derived from the models are presented. As this plural implies, we are paralleling completion of the complex full life system model with two streamlined alternate forms. More on those shortly. First, why use models?

Uses of these models

- to explore the effects of direct actions taken to stop or minimize the impacts of gypsy moth: application of *B.t.*, virus, pheromone, sterile moth or egg release, or chemical insecticides.
- to explore the manipulation of forest stands: removal of particular host species, restructuring of stands or changing age distributions, planting of new species, or improving habitat for natural enemies.
- to explore the manipulation of natural

enemies--predator and parasite introduction or enhancement; exploring viral pathogen alternatives, testing enhancements, exploring their effects on the system.

1. History - code development and restructuring.

The Gypsy Moth Life System Model has been under development for several years. The initial framework was written under contract to the Northeastern Station's Gypsy Moth R&D Program in 1983. Since then the model has undergone significant evolution, following the supporting research. The model now describes the dynamics of the gypsy moths, the stand in which they live, and dynamics of the gypsy moth's natural enemies within the stand. We first concentrated on completion of the development of the model. This has entailed completion of portions of the code, restructuring the existing code to permit easier maintenance, making it easier to transfer to alternate hardware and operating systems, and to permit new knowledge to be more easily incorporated into the existing code.

More recently we have been working to develop a user-friendly input-output control system for the model that will allow any interested person access to the model through menu screens and edit windows, permitting the design of simulations, as well as the manipulation of parameters and functions. This menu-based system provides means for the user to manage input data, save and retrieve data files, and to view and permanently archive output tables and files.

2. Complete input-output control system for Stand-Damage Model.

The Stand-Damage Model comprises the stand portion of the Life System Model, including the stand management section, the weather model, as it affects stand growth, and user-supplied defoliation scenarios. Besides writing the code that controls the model user environment, we have completed documentation of the Stand-Damage Model. A User's Guide, ready for review, describes installation, access and control for the user of the model. Figure 1 shows the main menu bar with the **Trees** options sub-menu open to **Add tree species** to the initial stand. A complete description of scientific basis and formulations of the model is just being revised, so as you read this it should be in the hands of reviewers. To complete the documentation of the package, a Programmer's Guide to the input-output control system has also been completed, rounding out the package that is going to reviewers. Along with the description of how to use the installation and utility software provided in the

User's Guide, the Programmer's Guide describes the logic and code needed to produce the installation package. The model will be available on disk, along with the complete publication package, by the end of this year.

3. Revised FORTRAN code, linked to the C-based frontend.

We have expended quite a bit of energy revising the FORTRAN code in preparation for linking the model to the user-friendly control system. This work has also made it possible to make the translation to the C language much easier and efficient. At this point, you might ask why bother with FORTRAN code translation to the C language. This translation will make the model much more portable to other computer systems. C provides better structuring of data, dynamic memory allocations, and other features that will make the code more useful and efficient. C is becoming the standard for most hardware and Unix seems to be the operating system that is most utilized.

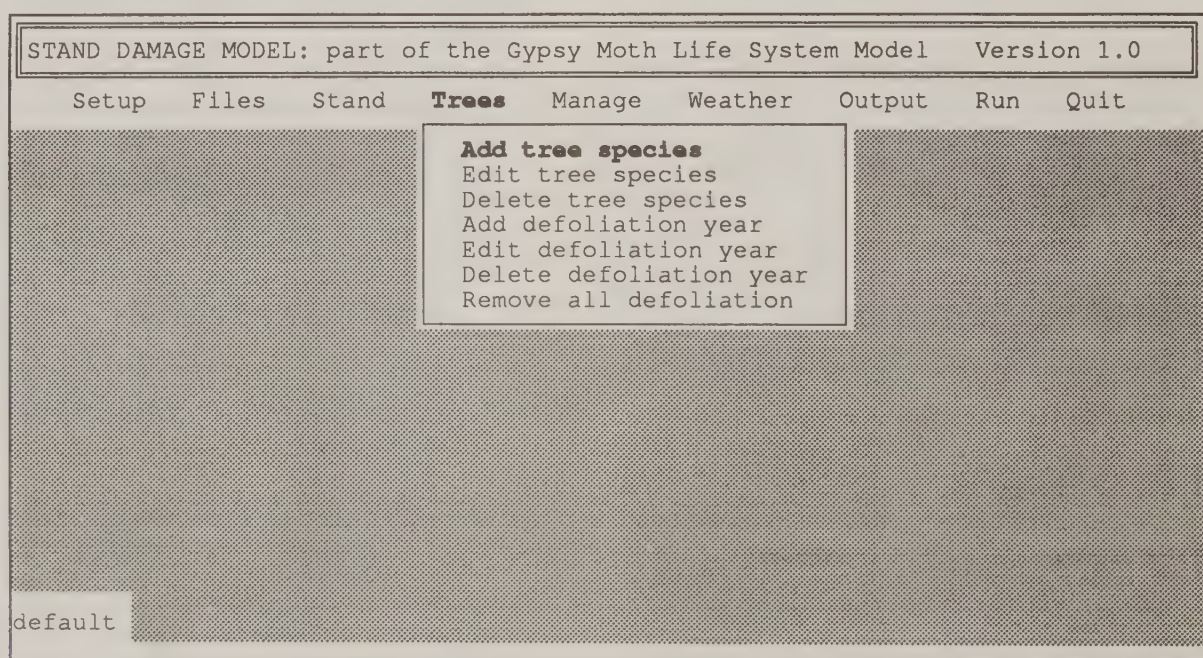


Figure 2 The **Trees** pull-down menu provides access to add, edit, or delete tree species-specific data, including defoliation by canopy strata within species.

If the operating systems are not Unix, almost any hardware operating system will support a C compiler. Of course the Forest Service, under Project 615, is in the process of moving to Uncle Sam's standards for Unix, POSIX. This translation will permit us to immediately compile the models and make them available to users in that window-based environment. As with similar window-based operating systems on microcomputers, the user has to know less about the computer to access and utilize this computing power.

4. Code transformations:

Major sections of the detailed model are already well on their way to being C based. Both the Stand-Damage Model and the pathogen submodel have undergone extensive code revisions and are being translated to C. The predator and parasite submodels are completely revised and restructured, and written in C. The gypsy moth subsystem, the final subsystem to undergo these revisions, will be done this fall. Along with the fact that most of the utilities and related software modules have been written, the installation package that serves to install the Stand-Damage Model will be used for installation of the full system, along with other portions of the package.

As mentioned, we have also begun the development of smaller, more efficient versions of the gypsy moth system model. Dr. Alexei Sharov, visiting scientist at West Virginia University, has taken the lead in developing an intermediate system--one that does not carry all the complexity of the full model but still provides means to explore the multi-species, multi-trophic-level interactions of the gypsy moth in stands. The most compact system is being developed by Nathan Voorhis, under the guidance of Dr. Joseph Wilder of the Department of Mathematics at West Virginia University. These alternative formulations will provide the ability to quickly and efficiently explore stability and long term behavior properties of the models that would be prohibitive using the full system. Once these abbreviated formulations are analyzed and understood, they will also provide means to efficiently link to other models or systems of models.

5. Uses for the Life System Models.

This brings us to the questions of Who and How?

Who might use them: The models will be of most interest initially to research scientists as they explore the dynamics of the gypsy moth life system under various hypotheses. Once the models become thoroughly tested, forestry consultants and managers will find them of use in exploring management issues. Teachers and students will also find the models useful as tools to learn about the gypsy moth and the ecosystems that it inhabits.

How might they be used: Besides exploring specific predictions, I think that the most common use will be in comparing alternative hypothetical situations or controlled variations for some selected parameters. This will provide useful insights into the mechanisms of successful management treatments. In explorations arising from research hypotheses, the use of alternate model forms that embody these alternate hypotheses may be used, and there will be improvements to our understanding of the biological system which will be incorporated into model revisions. Another area of interest is silvicultural alternatives; better understandings of the intermediate and long term implications of these options will arise from the considerations of simulated alternate management scenarios. As our understanding of the biology and population dynamics of natural enemies is increased, there will be need to make comparisons of alternate formulations that incorporate these new understandings. Other models are being developed to assess the spatial aspects of the gypsy moth problem: spread of the generally infested area and the probability of presence of gypsy moth at coarser spatial resolutions. Once all of these models are linked to, or available through, other systems such as the GypsES Decision Support System for gypsy moth management, or the Northeastern Decision Model that permits users to explore multi-resource options in forest management, considerations of management of alternatives can be followed in further detail and linked to other portions of the ecosystem through the exploration of simulations. While there are many uses that we look forward to as the models evolve, immediate use can be made of the Stand-Damage Model to explore the effects of gypsy moth defoliation on stand growth and tree mortality.

GYPSY MOTH MANAGEMENT

Operations Update

AVIATION MANAGEMENT AND SAFETY

Bob Adams
Area Aviation Officer
USDA Forest Service
Forest Health Protection
Radnor, PA

Over the past eighteen months to two years, interest in aviation management and safety in the Northeastern Area has increased with a great deal of enthusiasm and urgency, especially in the Cooperative Gypsy Moth Suppression Projects, where an unfortunate series of accidents has occurred. In order to more effectively accomplish its mission, the Forest Service has adopted a goal to:

"Improve safety and performance in all aerial suppression projects."

In order to assess aviation management and safety, one needs to take into account **three major areas of consideration:**

MANAGEMENT OPERATIONS SAFETY

They are like the **alpha/omega**, one does not exist without the other and it is difficult to tell where one begins and the other ends.

Management has the overall responsibility. The job to be done must be well defined and the equipment needed to complete it must be identified, and subsequently procured, inspected and tested. Contract specifications must be complete, thorough and enforceable! Management must be informed and involved in each project.

Management must be willing to go the "extra mile" to see that project personnel are supported by headquarters; are available in sufficient numbers; and, are appropriately trained.

Operations is the act of carrying out the project. Everyone, from the pilots to the project leaders to the mixing and loading crew to the contracting officer is involved during project activities. Everyone has a role and they must work together as a team.

Safety is the project ingredient that ensures success of the activity without harm to personnel, equipment and/or the environment. If there is a mishap or failure, then not only may there be harm done, but the goals and objectives of the organization may not be met. It is hard work to manage a project safely, it is easy to depend on luck!

Some **Management** concerns:

1. Is the job properly identified and equipment selected to meet the requirements?
2. Are qualified personnel and contractors available to do the job?
3. Are contracting officers, risk management specialists and contractor representatives involved in project planning--as well as Gypsy Moth specialists?
4. Has there been consideration of alternate forms of contracting, such as negotiated contracts as well as bid contracts?
5. Are alternatives to agency provided information, such as flight hazard maps, examined with risk managers and contractors?
6. Are contract pre-work inspections held as well as normal inspections made during the course of the project?

Some Operations concerns:

1. Is the workload distributed evenly, and are there enough aircraft, pilots and support personnel to do the job safely and efficiently?
2. Are operations facilities identified as part of a comprehensive plan, before activities begin?
3. Are other airspace users notified?
4. Is the need for airborne observers clearly identified and provided for in the planning process?
5. Are project vehicles inspected and road-worthy? Are drivers trained?

Some Safety concerns:

1. Is a project Safety Management Plan written as an integral part of the overall project plan (the "Work and Safety Plan")?
2. Is there a "crash-rescue" plan written, available and amended for each operational site? Does it contain a checklist to follow if there is an accident?
3. Are local emergency authorities involved in the planning process?
4. Does the contract require/can the operator provide additional pilots and other personnel, in case of sickness or time off?
5. Do project supervisors routinely encourage all personnel to take adequate rest and timeoff, and see that they do it?
6. Are safety reviews conducted routinely throughout the project and are successes as well as failures documented?
7. Are only "mission essential" personnel involved in the project, especially if airborne? Are observer aircraft provided for and used?

These items represent a checklist of considerations for any aerial project, including spraying. There are many more! An important message in all of the above is that **management must redeem its responsibilities**. Then the probability of project success is greatly enhanced and failures/mishaps can

be held to a minimum. In the project planning process, if all parties are involved there is a much higher probability of success!

TRAINING UPDATE

The USDA Forest Service, Northeastern Area facilitates training in all of these areas by drawing upon expertise from within, other agencies and cooperators, and the industry. During the past year, we have offered training courses in the following subject areas:

- Basic Aviation Management and Safety Skills
6 hours 13 courses
- S-270 Basic Aviation Operations
17 hours 3 courses
- I-220 Basic Incident Command System (ICS)
8 hours 1 course
- Northeast Aviation Management and Safety
32 hours 1 course

During the coming year the Area will be offering similar courses and a few new courses in technical areas, such as communications, aerial observer and sketch mapping, and pumps/meters/hydraulics. Currently planned for the week of October 21, 1991, are back-to-back sessions of S-270 Basics Aviation Operations. These will be given in Fairfax, VA. For more information contact Sheryl Parker at 804-786-3515 or Mark Taylor at 301-841-5922.

The Coupon

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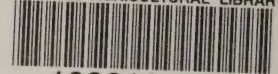
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